



UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/523,167	03/10/2006	Mohammad Jaber Borran	088245-0799	8220

23524 7590 06/28/2010
FOLEY & LARDNER LLP
150 EAST GILMAN STREET
P.O. BOX 1497
MADISON, WI 53701-1497

EXAMINER

BURD, KEVIN MICHAEL

ART UNIT	PAPER NUMBER
----------	--------------

2611

MAIL DATE	DELIVERY MODE
-----------	---------------

06/28/2010

PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.



UNITED STATES PATENT AND TRADEMARK OFFICE

Commissioner for Patents
United States Patent and Trademark Office
P.O. Box 1450
Alexandria, VA 22313-1450
www.uspto.gov

**BEFORE THE BOARD OF PATENT APPEALS
AND INTERFERENCES**

Application Number: 10/523,167
Filing Date: March 10, 2006
Appellants: BORRAN ET AL.

Paul S. Hunter
For Appellant

EXAMINER'S ANSWER

This is in response to the appeal brief filed 4/27/2010 appealing from the Office action mailed 10/15/2009.

(1) Real Party in Interest

The examiner has no comment on the statement, or lack of statement, identifying by name the real party in interest in the brief.

(2) Related Appeals and Interferences

The examiner is not aware of any related appeals, interferences, or judicial proceedings which will directly affect or be directly affected by or have a bearing on the Board's decision in the pending appeal.

(3) Status of Claims

The following is a list of claims that are rejected and pending in the application:

- I. Claims 26, 27, 30, 31, 35, 36, 39, 40, 44-49 and 51-53 are rejected under 35 U.S.C. 102(e) as being anticipated by Fette et al (US 6,560,445).
- II. Claims 28, 29, 37 and 38 are rejected under 35 U.S.C. 103(a) as being unpatentable over Fette et al (US 6,560,445) in view of Seshadri et al (US 2002/0090035).
- III. Claims 32, 41 and 50 are rejected under 35 U.S.C. 103(a) as being unpatentable over Fette et al (US 6,560,445) in view of Dabak et al "Signal Constellations for Non-Gaussian Communication problems" Statistical Signal and Array Processing.

Art Unit: 2611

Minneapolis, April 27-30 1993. Proceedings of the International Conference on Acoustics, Speech, and signal Processing (ICASSP), New York, IEEE, US, VOL. 4, pages 33-36.

IV. Claims 33, 34, 42 and 43 are rejected under 35 U.S.C. 103(a) as being unpatentable over Fette et al (US 6,560,445) in view of Hui et al (US 6,674,820).

V. Claims 26, 27, 30-32, 35, 36, 39-41, 45-53 are provisionally rejected on the ground of nonstatutory obviousness-type double patenting as being unpatentable over claims 41, 42, 45, 49, 50 and 57-58 of copending Application No. 10/671,346.

(4) Status of Amendments After Final

The examiner has no comment on the appellant's statement of the status of amendments after final rejection contained in the brief.

(5) Summary of Claimed Subject Matter

The examiner has no comment on the summary of claimed subject matter contained in the brief.

(6) Grounds of Rejection to be Reviewed on Appeal

The examiner has no comment on the appellant's statement of the grounds of rejection to be reviewed on appeal. Every ground of rejection set forth in the Office action from which the appeal is taken (as modified by any advisory actions) is being maintained by the examiner except for the grounds of rejection (if any) listed under the subheading "WITHDRAWN REJECTIONS." New grounds of rejection (if any) are provided under the subheading "NEW GROUNDS OF REJECTION."

(7) Claims Appendix

The examiner has no comment on the copy of the appealed claims contained in the Appendix to the appellant's brief.

(8) Evidence Relied Upon

6,560,445	FETTE ET AL	5-2003
6,674,820	HUI ET AL	1-2004
2002/0090035	SESHADRI ET AL	7-2002

Dabak et al "Signal Constellations for Non-Gaussian Communication problems"
Statistical Signal and Array Processing. Minneapolis, April 27-30 1993. Proceedings of
the International Conference on Acoustics, Speech, and signal Processing (ICASSP),
New York, IEEE, US, VOL. 4, pages 33-36.

(9) Grounds of Rejection

The following grounds of rejection are applicable to the appealed claims:

Claim Rejections - 35 USC § 102

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

I. Claims 26, 27, 30, 31, 35, 36, 39, 40, 44-49 and 51-53 are rejected under 35 U.S.C. 102(e) as being anticipated by Fette et al (US 6,560,445).

Regarding claims 26, 27, 30, 31, 35, 36, 39, 40, 45-49 and 51-53, Fette discloses a method of and apparatus for processing a received space-time constellation. The signal to noise ratio (SNR) of each coefficient is used to determine the constellation that will be used for transmission (column 8, lines 20-51). The SNR is an estimation of the quality of the channel used for communication. The channel quality is a channel estimation and errors in the channel quality (a reduced level of channel quality) represent channel estimation errors. The level of the signal is determined as is the level of the noise present in the channel to determine a signal-to-noise-ratio (SNR). The

Art Unit: 2611

noise or distortion present in the communication channel is a channel estimation error since the noise or distortion represents errors in the channel. When little or no distortion is detected, the error is minimized and the signal is transmitted with minimal interference. The receiver will transmit the channel conditions to the transmitter (abstract) and "in response to predetermined conditions selects a cepstral constellation to be utilized." (abstract). The receiver will demodulate the received signal to recover the transmitted data.

Regarding claim 44, Fette discloses the communication system shown in figure 18. The transceivers comprise transmitter and receiver components and can be either a base station, mobile station or both.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

II. Claims 28, 29, 37 and 38 are rejected under 35 U.S.C. 103(a) as being unpatentable over Fette et al (US 6,560,445) in view of Seshadri et al (US 2002/0090035).

Regarding claims 28 and 37, Fette discloses the method and apparatus stated above. Fette does not disclose using multiple receive antennas. Seshadri discloses utilizing multiple receive antennas in the communication system (figure 1). "It is well

Art Unit: 2611

known that using a diversity scheme can improve the signal-to-noise ratio of a received information signal in a telecommunication system” (paragraph 0003). The receiver diversity scheme is shown in the figure. For this reason, it would have been obvious for one of ordinary skill in the art at the time of the invention to combine the teaching of Seshadri into the method and apparatus of Fette.

Regarding claims 29 and 38, Fette discloses the method and apparatus stated above. Fette does not disclose decoding the demodulated signal using an outer code that includes codes over a plurality of signal matrices across time. Seshadri discloses the receiver shown in figure 3. The demodulator 312 is coupled to decoder 314.

Paragraph 0104 discloses the decoding of the received signal utilizing outer trellis code in orthogonal matrices generated by the space time block code. By concatenating an outer trellis code designed for additive white Gaussian noise (AWGN) channel with space time block code additional performance gain is obtained (paragraph 0104). For this reason, it would have been obvious to incorporate the decoder of Seshadri into the method and apparatus of Fette.

III. Claims 32, 41 and 50 are rejected under 35 U.S.C. 103(a) as being unpatentable over Fette et al (US 6,560,445) in view of Dabak et al “Signal Constellations for Non-Gaussian Communication problems” Statistical Signal and Array Processing. Minneapolis, April 27-30 1993. Proceedings of the International Conference on Acoustics, Speech, and signal Processing (ICASSP), New York, IEEE, US, VOL. 4, pages 33-36.

Regarding claims 32, 41 and 50, Fette discloses the method and apparatus stated above. Fette does not disclose the distance between the constellation points as a function of a Kullback-Leiber distance. However, Dabak discloses a method of computing optimum signal sets (abstract). By optimizing the constellation points for non-Gaussian communication problems, the problems can be overcome and proper communication between users be achieved. This optimization is achieved since the Kullback information can be used to express how performance varies with noise amplitude distribution and with signal set choice (III). Additional information regarding the Kullback information is provided in heading II. It would have been obvious for one of ordinary skill in the art at the time of the invention to combine the teachings of Dabak into the method of Fette for the reasons stated above.

IV. Claims 33, 34, 42 and 43 are rejected under 35 U.S.C. 103(a) as being unpatentable over Fette et al (US 6,560,445) in view of Hui et al (US 6,674,820).

Regarding claims 33, 34, 42 and 43, Fette discloses the method and apparatus stated above. Fette does not disclose utilizing a maximum likelihood coherent demodulator to demodulate the received signal. Hui discloses to extract the transmitted signal of symbols from the received signal. The receiver will typically include a demodulator which may be a coherent demodulator such as a maximum likelihood sequence estimation demodulator. To adapt to channel variations from each data burst to the next, an associated channel estimator is typically provided for the demodulator (column 1, lines 57-65). For these reasons and to use typical components to minimize

Art Unit: 2611

the size and complexity of the circuitry, it would have been obvious for one of ordinary skill in the art at the time of the invention to incorporate the typical demodulator of Hui into the method and apparatus of Fette.

Double Patenting

The nonstatutory double patenting rejection is based on a judicially created doctrine grounded in public policy (a policy reflected in the statute) so as to prevent the unjustified or improper timewise extension of the “right to exclude” granted by a patent and to prevent possible harassment by multiple assignees. A nonstatutory obviousness-type double patenting rejection is appropriate where the conflicting claims are not identical, but at least one examined application claim is not patentably distinct from the reference claim(s) because the examined application claim is either anticipated by, or would have been obvious over, the reference claim(s). See, e.g., *In re Berg*, 140 F.3d 1428, 46 USPQ2d 1226 (Fed. Cir. 1998); *In re Goodman*, 11 F.3d 1046, 29 USPQ2d 2010 (Fed. Cir. 1993); *In re Longi*, 759 F.2d 887, 225 USPQ 645 (Fed. Cir. 1985); *In re Van Ornum*, 686 F.2d 937, 214 USPQ 761 (CCPA 1982); *In re Vogel*, 422 F.2d 438, 164 USPQ 619 (CCPA 1970); and *In re Thorington*, 418 F.2d 528, 163 USPQ 644 (CCPA 1969).

A timely filed terminal disclaimer in compliance with 37 CFR 1.321(c) or 1.321(d) may be used to overcome an actual or provisional rejection based on a nonstatutory double patenting ground provided the conflicting application or patent either is shown to be commonly owned with this application, or claims an invention made as a result of activities undertaken within the scope of a joint research agreement.

Effective January 1, 1994, a registered attorney or agent of record may sign a terminal disclaimer. A terminal disclaimer signed by the assignee must fully comply with 37 CFR 3.73(b).

V. Claims 26, 27, 30-32, 35, 36, 39-41, 45-53 are provisionally rejected on the ground of nonstatutory obviousness-type double patenting as being unpatentable over claims 41, 42, 45, 49, 50 and 57-58 of copending Application No. 10/671,346. Although the conflicting claims are not identical, they are not patentably distinct from each other because 10/671,346 discloses a method of establishing a constellation by determining a characteristic of a channel (claim 41). The characteristic is the SNR (claim 42). The

Art Unit: 2611

selected constellation is that utilized for the transmission and the input bit stream is encoded in an amplitude of the symbols (claim 41). The reference discloses more detail than the instant claims. However, the more specific "anticipates" the broader (see *In re Goodman* – 29 USPQ2d 2010).

Claims 26, 27, 30-32, 51 and 52 correspond to claim 42 of the reference.

Claims 49 and 50 correspond to claim 57 of the reference.

Claims 35, 36, 39-41, 45-48 and 53 correspond to claim 49 of the reference.

This is a provisional obviousness-type double patenting rejection because the conflicting claims have not in fact been patented.

(10) Response to Argument

(A) Introduction

Prior to responding to the arguments, the examiner would like to describe the field of the invention, which is the same for the application and for the Fette reference.

In communication systems, a transmitter transmits a data signal to a receiver over a transmission medium. The medium will introduce noise or some type of distortion to the received signal which causes errors to occur in the decoding process after the transmitted signal has been received at the receiver. By determining the errors

Art Unit: 2611

present in the channel, different transmission methods may be selected to overcome the interference/noise/distortion present in the channel. Selecting a specific signal constellation according to the channel conditions present allows for the transmitted signal to be more resistant to the interference/noise/distortion present in the channel. The constellation that is selected by the transmitter will be known in the receiver as well, allowing the receiver to demodulate, decode and recover the originally transmitted data.

(B) Description of the Fette reference

Fette discloses a modulation/demodulation method for use in RF communication. A transmitter modulates information onto a plurality of carrier signals transmitted simultaneously over a plurality of frequencies using cepstral modulation. The receiver receives and demodulates the transmitted signals. The receiver monitors the channel conditions and selects a constellation to be utilized. The receiver provides the constellation information to the transmitter and the transmitter utilizes the selected constellation in its next transmission (abstract). The SNR of the transmitted signal is measured to determine the quality of the communication channel. This value is used to determine the constellation that will be used for the data transmission (column 8, lines 20-51).

(C) Description of the Seshadri reference

Art Unit: 2611

Seshadri discloses the RF communication system utilizing a plurality of transmitter and receiver antennas as shown in figure 1. These antenna diversity schemes can improve signal-to-noise ratio (SNR) of a received information signal in a telecommunication system (paragraph 0003).

(D) Description of the Dabak reference

Dabak discloses signal constellations used for data transmissions. Dabak discloses a method for optimizing constellation points to overcome communication problems and to provide for better communication between a source and destination.

(E) Description of the Hui reference

Hui discloses a receiver comprising a maximum likelihood sequence estimation demodulator. The demodulator typically comprises a channel estimator (column 1, lines 57-65). The receiver is able to adapt to channel variations in each data burst. The receiver will be able to more accurately recover the transmitted data using these components.

(F) Response to argument

The examiner discusses the claims in the same order as appellants.

I. Claims 26, 27, 30, 31, 35, 36, 39, 40, 44-49 and 51-53 are rejected under 35 U.S.C. 102(e) as being anticipated by Fette et al (US 6,560,445).

Claim 26- Appellants state they fail to follow the examiner's logic in the previous final office action's rejection of the pending claims. Clarification is provided. SNR is an estimation of the quality of a channel used in communication. The level of the signal present in the channel is determined as is the level of the noise present in the channel to determine the signal-to-noise ratio (SNR). When a noise level of zero is present, the channel is equal to an ideal channel. When a noise level is greater than zero, the present channel is not ideal and channel estimation error is present. Channel estimation error is the difference between the ideal or expected channel and the present channel. The difference or error is determined and represents the noise/interference/distortion present in the channel. The distortion level of the channel can be represented in a number of ways such as SNR, BER, number of errors, etc, to achieve a measure or estimation of a channel. Therefore, the representation of the channel by using the SNR will represent those channel estimation errors.

Appellants state they disagree with the examiner's statement that noise or distortion present in the communication channel is a channel estimation error since the noise or distortion represent errors in the channel. Again, the SNR of Fette is an

Art Unit: 2611

estimation of the quality of a channel used in communication. The level of the signal present in the channel is determined as is the level of the noise present in the channel to determine the signal-to-noise ratio (SNR). When a noise level of zero is present, the channel is equal to an ideal channel. When a noise level is greater than zero, the present channel is not ideal and a channel estimation error is present. Channel estimation error is the difference between the ideal or expected channel and the present channel. The difference or error is determined and represents the noise/interference/distortion present in the channel. The distortion level of the channel can be represented in a number of ways such as SNR, BER, number of errors, etc, to achieve a measure or estimation of a channel. Therefore, the representation of the channel by using the SNR will represent those channel estimation errors.

Claims 27, 36 and 52- Appellants state claims 27, 36 and 52 would not narrow claims 26, 35 and 51. The examiner believes the limitation of "a signal-to-noise ratio" does narrow the limitation of "a channel estimation error". The SNR limitation narrows the broader limitation of a channel estimation error. As stated above, the SNR is one of many possible values that represent the measure or estimation of the channel and the channels corresponding channel quality.

Claims 28, 29, 37 and 38- Appellants rely on the patentability of the parent claims regarding claims 28, 29, 37 and 38. Therefore, the response to the arguments for claims 28, 29, 37 and 38 is the same as the response to argument for claims 26 and 35.

Claims 32, 41 and 50- Appellants rely on the patentability of the parent claims regarding claims 32, 41 and 50. Therefore, the response to the arguments for claims 32, 41 and 50 is the same as the response to argument for claims 26, 35 and 49.

Claims 33, 34, 42 and 43- Appellants rely on the patentability of the parent claims regarding claims 33, 34, 42 and 43. Therefore, the response to the arguments for claims 33, 34, 42 and 43 is the same as the response to argument for claims 26 and 35.

Claims 26, 27, 30-32, 35, 36, 39-41 and 45-53- The double patenting rejection of the claims stated in the final office action is maintained. Appellants have not presented remarks addressing this rejection.

(11) Related Proceedings Appendix

No decision rendered by a court or the Board is identified by the examiner in the Related Appeals and Interferences section of this examiner's answer.

Art Unit: 2611

For the above reasons, it is believed that the rejections should be sustained.

Respectfully submitted,

/Kevin M. Burd/

Primary Examiner, Art Unit 2611

Conferees:

/David C. Payne/

Supervisory Patent Examiner, Art Unit 2611

/Mohammad H Ghayour/

Supervisory Patent Examiner, Art Unit 2611